



Urban Pathways

Factsheet

Electric handcart (Elo-cart)



Manual Handcart



Electric handcart (Elo-cart) by Auto Truck



**Wuppertal
Institut**

UN HABITAT
FOR A BETTER URBAN FUTURE

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The Urban Pathways project helps to deliver on the Paris Agreement and the NDCs in the context of the New Urban Agenda and the Sustainable Development Goals. It has established a facility in close cooperation with other organisations and networks active in this area to support national and local governments to develop action plans and concrete implementation measures to boost low-carbon urban development. This builds on UN-Habitat's role as "a focal point on sustainable urbanisation and human settlements including in the implementation and follow-up and review of the New Urban Agenda". The project develops national action plans and local implementation concepts in key emerging economies with a high mitigation potential. The local implementation concepts are being developed into bankable projects, focusing on the access to urban basic services to create a direct link between climate change mitigation and sustainable development goals.

The project follows a structured approach to boost Low Carbon Plans for urban mobility, energy and waste management services that deliver on the Paris Agreement and the New Urban Agenda. The project works on concrete steps towards a maximum impact with regards to the contribution of urban basic services (mobility, energy and waste management) in cities to global climate change mitigation efforts and sustainable and inclusive urban development. This project makes an active contribution to achieve global climate change targets to a 1.5°C stabilisation pathway by unlocking the global emission reduction potential of urban energy, transport and resource sectors. The project will contribute to a direct emission reduction in the pilot and outreach countries, which will trigger a longer term emission reduction with the aim to replicate this regionally and globally to make a substantial contribution to the overall emission reduction potential.

This project implements integrated urban services solutions as proposed in the New Urban Agenda providing access to jobs and public services in urban areas, contributing to equality and social coherence and deliver on the Paris Agreement and the Sustainable Development Goals. This is the first dedicated implementation action oriented project, led by UN-Habitat to deliver on inclusive, low-carbon urban services. Securing sustainability and multiplier effect, the project aims to leverage domestic and international funding for the implementation projects that will follow from this initiative.

Urban Pathways

Project concept

Project aims

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Auto-Truck E.A Green Technologies Ltd is a Kenyan company that was set up to research and manufacture green technology mobility products for the vast and untapped African market. The drive behind this company is Mr. Kenneth Guantai, a Kenyan innovator aged 34 years and who has great passion in environmental protection. His interest is in developing mobility technologies that can be harnessed to reverse pollution that results from fossil fuel combustion by the conventional motor vehicles.

He has innovated his unique model of electric light-duty three-wheeler as well as electric handcart for use in light goods transportation and Taxi services in major Cities and towns across Kenya with the possibility of up-scaling to other regions of Sub-Saharan Africa and beyond. He is also at an advanced stage of developing a utility component that will enable his three-wheelers and handcarts to self-recharging with very little motion that will be known as Regenerative Motion Recharging System (RMRS), a technology that will enable EVs self-recharge through kinetic motion and which will completely eliminate the need for external power source like fuel or electricity plug in for operation.

The innovation has been duly registered and patented and also received all government of Kenya approvals that gives the go-ahead for the manufacture of the product. Kenneth has developed and tested several prototypes of the line products which have yielded good results that have given him the confidence of rolling off the products under mass production for commercialization.

In Kenyan urban areas and cities, and particularly in Nairobi, many people use motor vehicles and three wheelers (Tuk-tuks) for transportation as well as numerous fossil fuel motor bikes. Besides this, small scale business people also use manual handcarts for ferrying goods while city cleaners ferry waste materials from one point of town to the other. On one hand, the three-wheelers and the two-wheelers pollute the environment through combustion of petroleum while the handcarts are pulled by the operators thereby creating traffic jams through motor vehicles obstructions because they are cumbersome and energy sapping to the operators and in particular the City Vendors. Introduction of self-recharging electric three-wheelers and handcarts will help reduce pollution by increasing the adoption of green energy technology to replace fossil fuels for powering urban mobility through the green electric three-wheelers and the handcarts.

In brief

Our solution is about engineering, fabrication and introduction of electric powered self-recharging three-wheelers and handcarts to reduce reliance on fossil fuel that is required to enable conventional motor vehicles, three and two-wheelers to operate. As indicated earlier, part of the project is the introduction of a system that harnesses slight kinetic motion to generate sufficient electric charge that will be used to re-charge batteries for perpetual mobility. This innovation therefore seeks to completely replace the need for a hybrid system that calls for part utilization of fossil fuel to power-recharge of batteries before they are switched on. By doing so, there will be reduced air pollution which will go a long way in helping to conserve the environment and protect it from further degradation as well as help improve health of the millions living in urban areas. We envisage a future whereby our technology will be widely adopted to replace fossil fuel as a source of energy for mobility and industrial use.

The introduction of green technology for urban mobility in the country will help in reducing air pollution as a result of fuel combustion by the millions of motor vehicles plying urban roads in Kenya on daily basis. Many urban cities and towns are covered by smog which blankets the skies with dark grey cover that leads to polluted water once it rains. With reduced prevalence of air pollution, there will be improved health among the residents of these towns where instances of diseases related to air pollution such as lung cancer will drastically reduce. Citizens will also be able to enjoy natural sunshine that will arise as a result of reduced smog which creates artificial sky coverage.

On waste management, our products will immensely be used to collect garbage and other waste materials in overcrowded parts of the City where it is inaccessible for the big trucks hence easing on making the city clean and habitable for its citizen and consequently cutting down on diseases prevalence with dirty environment.

Due to the enhancement of the clean working environment, there will be improved work productivity among the citizens hence increased general welfare in Economic and local jobs creations especially among the youth, women and people with disabilities.

Measures

Results

Technical & financial considerations

For such innovation to function smoothly and yield maximum benefits, city administrations must invest substantially in smooth and sufficient pathways that will enable users to enjoy maximum benefits from the new technology. Good road infrastructure reduces wear and tear that may result in increased operational costs that the technology is supposed to guarantee to its users. Urban road networks need to be redesigned to ensure safety of all road users including handcarts operators which will reduce road accidents that lead to loss of life and property.

The city Government must ensure it set aside funds to sensitize people on the needs to adopt this new technology as well as educating them on the needs to curb city carbon emission through clean mobility to safeguard their health and that of generation to come. Funding must also be set aside to improve on the infrastructural pathways to make it easy and efficient for the operators especially vendors and Taxi operators to manoeuvre in the ever-jammed City streets and roads.

Governments will have to introduce and put in place legislation/policies that will encourage the adoption of green electric mobility technology as a better replacement of fossil fuel for powering mobility in their jurisdictions. Green energy is a very new technology in Kenya and would therefore require to be nurtured and stimulated for faster adoption if its benefits are to be reaped in a short period.

The Government must also ensure clear implementations frameworks are supported and relevant legislative instruments enacted to guide its operations hence enabling the success and smooth running of such programs.

Kenya has made commendable strides in ensuring climate issues remains their core agenda in anticipation to thwart the calamities necessitated through adverse weather conditions due to climatic inequities.

Policy/legislation



We are targeting small business persons (Vendors) who need to transport small wares from one point to another as well as taxi operators within the City. Our electric handcart is ideal for rural farmers for transportation of farm produce to the market, industries for transportation of factory goods from and to warehouse, towns for collection of garbage and other material wastes in estates to central collection points among others.

Auto-truck E.A Green technology is the lead agency in the production of the electrical eco-green three-wheelers (Elo-Cabs) and handcarts (Elo-Carts). The company is requesting funding support from Green Climate Fund (GCF) for the rolling out of the product on mass production scale and distribution to the targeted end users. The company has partnered with the National Environmental Management Authority (NEMA) in Kenya in the process of developing standards for the emerging green mobility sector. It has also gone further to partner with the Kenya vehicle manufacturing industry (KVM) for effective assembly line and model customization and branding.

National policy frameworks are important in regards to streamlining financial support mechanism as well as ensuring good working environment in pursuit to implement this program.

Use of electric mobility technology is highly scalable across regions. We will be implementing the project initially in Nairobi City and later on expand the project after its successful adoption to the other cities across Kenya and beyond.

Replication of the technology to the other cities will depend on the support we will receive from the other cities in developing adequate infrastructure for deployment of the same and their Government willingness and zeal to support it through proper legislations and policy implementations that will foster rather than hinder smooth entrance of this technology into their Cities and towns.

The ability to ensure that the masses in these cities fully adopts and manages this electric mobility technology will also play a vital role in our penetrations and eventual success of the program in these Nations.

There must be bold and holistic policies and mechanisms to regulate the importation and use of the fossil fuel components of these products to foster demand for the more efficient clean electric mobility which will ultimately ensure full transition to this technology over-time in these Cities and Nations.

Institutions

Transferability

Case Study: Nairobi

Nairobi is a completely modern creation, and everything here has been built since the city was founded in 1899. As the tracks of the East African Railway were laid down between Mombasa and Kampala, a depot was established at a small stream known to the Maasai as uaso nairobi (cold water).

Nairobi is in many ways an archetype of the African colonial city, having purely colonial Origins, which shaped its structure and management at the time of Kenya's transition to independence. In fact, Nairobi was born of the European colonial project and was a means of entry into newly colonized land: the railway line (Blevin & Bouczo 1997). Like other African cities, after independence Nairobi was characterised by a rapid increase in rural to urban migration, accompanied by the proliferation of small-scale trade and petty commodity production, including un-serviced and un-authorized housing (Lee-Smith 1989).

Nairobi was first established as a transportation centre, which later grew to become an Administrative centre. The site was chosen by the Kenya-Uganda Railway (KUR) Constructors in June, 1899 (when the rail line reached Nairobi) because it offered a Suitable stopping place between Mombasa and Kisumu. There was adequate water supply from the nearby Nairobi River and the Mbagathi River; ample level land for Railway tracts, sidings, quarters; an elevated cooler ground to the west suitable for Residential purposes; an apparently deserted land offering freedom for land appropriation; and the area was free from tropical diseases (Blevin & Bouczo 1997; Boedecker 1936; Foran 1950; Owuor & Obudho 1997; Wamsley 1957).



Electric three-wheeler (Elo-cab) by Auto Truck

With the rapid accumulation of vehicular flow on Nairobi roads and the City's economic development, the City's environment is placed under increasing pressure due to air pollutants. Public and private transportation sector is important from an environmental and ecosystem point of view; it uses energy, particularly fossils fuels which are a source of air pollutants when ingested and processed.

Road transport emissions load ambient air with attendant pollutants. Air pollution also comes from production of goods and services, heating of houses, and rising particulates from dusty roads and pavements. Time spend on travelling on the roads are long due to traffics build up and jams.

The average travel time to work in Nairobi is estimated at about an hour in traffic, but could have since gone up. Ambient air pollution is closely related to the health of people. Air pollution too, has impacts on other aspects of the economy such as agriculture, and contributes to greenhouse gas emissions (GHG). Typical values for the vehicle share in total air pollution range from about 40% to 90% for carbon monoxide, hydrocarbons and nitrogen oxides and are somewhat lower for fine particulate matter.

Nairobi City is an important part of Kenya's economy and a regional hub on many fronts and has been developing rapidly in all aspects including population density that stands at about 4 million persons. This means that the city holds about 10% of the total population of Kenya. With a population density of about 4000 persons per square kilometre, the city's air pollution levels, atmospheric and environmental issues affect many persons.

The City County of Nairobi has given the company an order to fabricate 150 custom made electric handcarts that they will distribute to youth groups for ferrying garbage to central collection points and water bowzers for car wash businesses across the city suburbs. This is a pilot project that will be undertaken over a period of 3 years with possibility of up scaling to other towns within the City.

The total value of the supply contract is an equivalent of USD 180,000 with other major cities having shown great interest in our products. The company has good prospects for trading with county governments to deliver products that will be used on youth, women and

In action

people with disability empowerment as well as assist in managing the garbage menace in big cities across the country besides taming the chaotic fossil fuel three-wheeler taxi services across the city.

The Town and County Planners Association of Kenya (TCPAK) through the engagement of the KENMT BILL Engineers & Planners has initiated talks with us to include us in their planning activities through the ongoing seminars that is also aimed at considering the best options modes of electric mobility transportation services in our major Cities and Towns in Kenya. This shows how keen the stakeholders in city planning are with our activities and the interest it evokes in pursuit to find a lasting solution to the chaotic and pollutant mode of mobility in our Cities in Kenya.

The company has so far managed to distribute several handcarts to several potential customers for product testing and piloting and the feedback we have obtained from these customers have been very positive and have enabled us to improve on the functionalities of the product and make them more versatile and durable. We now have diversified and refined products that are more customers focused and therefore satisfying to their unique needs and desires in the product. The program is at the market entry stage having sold more than 25 electric handcarts to various users across the country and fabrications of the electric three-wheelers for piloting is underway with 50 earmarked for piloting within the major Cities in Kenya.

The program was able to secure a legal agreement with the major vehicle assembling entity (KVM) and local parts components production engineering plant (NMC) to spearhead the initial support in mass production as Auto-truck gears to set up its own assembling plant in Nairobi.

Results

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